

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A heating control system for controlling energization to a heater of a gas sensor disposed in an exhaust pipe of an internal combustion engine, the heating control system comprising:

exhaust pipe water determining means for determining whether water droplets exist in the exhaust pipe when the engine is started; and

activation energization controlling means for performing activation energization control for energizing the gas sensor with electric power capable of heating the gas sensor to activation temperature when a predetermined waiting period passes since the engine is started if the exhaust pipe water determining means determines affirmatively.

2. (Original) The heating control system as in claim 1, wherein the exhaust pipe water determining means requires that an elapsed period from the last start to the last stop of the engine is shorter than a predetermined period as at least one of requirements for the affirmative determination.

3. (Original) The heating control system as in claim 1, further comprising:

preheat energization controlling means for performing preheat energization control for energizing the gas sensor with lower electric power than in the activation energization

control before the activation energization control if the exhaust pipe water determining means determines affirmatively.

4. (Original) A heating control system for controlling energization to a heater of a gas sensor disposed in an exhaust pipe of an internal combustion engine, the gas heating control system comprising:

preheat energization controlling means for performing preheat energization control before activation energization control for energizing the gas sensor with electric power capable of heating the gas sensor to activation temperature,

wherein the preheat energization controlling means energizes the gas sensor with lower electric power in the preheat energization control than in the activation energization control during a predetermined period in which there is a possibility that water droplets exist in the exhaust pipe.

5. (Original) A heating control system for controlling energization to a heater of a gas sensor disposed in an exhaust pipe of an internal combustion engine, the heating control system comprising:

preheat energization controlling means for performing preheat energization control before activation energization control for energizing the gas sensor with electric power capable of heating the gas sensor to activation temperature,

wherein the preheat energization controlling means energizes the gas sensor with lower electric power in the preheat energization control than in the activation energization control so that water droplets in the gas sensor vaporize gradually and bumping of the water droplets is prevented.

6. (Original) The heating control system as in claim 5, further comprising:
gas sensor water determining means for determining whether the water droplets exist inside the gas sensor,

wherein the preheat energization controlling means performs the preheat energization control only when the gas sensor water determining means determines affirmatively.

7. (Original) The heating control system as in claim 6, wherein
the gas sensor water determining means requires that temperature of the heater at the time when the engine is stopped is lower than a predetermined temperature as one of requirements for the affirmative determination.

8. (Currently Amended) The heating control system as in ~~any one of claims 3 to 7~~
claim 3, wherein

the heating control system energizes the heater in duty cycle control and sets a smaller on-duty ratio in the preheat energization control than in the activation energization control.

9. (Currently Amended) The heating control system as in ~~any one of claims 3 to 7~~
claim 3, wherein

the preheat energization controlling means feedback controls the energization to the heater so that the temperature of the gas sensor is brought to a predetermined temperature.